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The reproduction of educational inequalities – do parenting and child behavioural problems matter?

Till Kaiser
Department of Psychology, Ruhr-Universität Bochum, Germany; WZB Berlin Social Science Centre, Germany

Jianghong Li
WZB Berlin Social Science Centre, Germany; Telethon KIDS Institute, University of Western Australia, Australia; Centre for Population Health Research, Curtin University, Australia

Matthias Pollmann-Schult
Department of Humanities, Social Science and Education, Otto-von-Guericke-Universität Magdeburg, Germany

Abstract
The strong link between parental socioeconomic status (SES) and children's success in school is well established. However, mechanisms that underpin this association remain a major issue in current research on social inequality. Using data from the Families in Germany Study and structural equation modelling, this study demonstrates that parenting styles and child behavioural problems explain, in part, the association between parental SES and child school grades for mathematics and German between the ages of 9 and 10. We found that parents with a low SES are more likely to be inconsistent in their parenting and to use psychological control with their children more often, these two factors being linked to child behavioural problems. Adverse parenting and behavioural problems are, in turn, associated with low school grades. Our findings also show that behavioural problems in children are associated with lower school grades independent of parenting style. These findings suggest that parenting styles and child behavioural problems and their interplay may be potential pathways that underpin the influence of parental SES on children's school achievement.

Keywords
Socioeconomic status, parenting, child behavioural problems, school grades, inequality, Germany

Corresponding Author:
Till Kaiser, Department of Psychology, Ruhr-Universität Bochum, WZB Berlin Social Science Centre, Reichpietschufer 50, Berlin, Germany.
Email: till.kaiser@rub.de

Introduction

The link between parents' socioeconomic status (SES) and their children's academic achievement is a key issue in sociological research on social stratification and social inequality. Ample studies show that students from a working-class background are less likely to go on to higher education than students from middle- and upper-class backgrounds (e.g. Breen and Jonsson, 2005). Although this link is well established, mechanisms that underpin it remain less well understood. This study contributes to our knowledge of the complex pathways from parents' SES to their children's academic achievement by incorporating psychological and child development concepts and their measures, such as parenting styles and child behavioural problems, into the inquiry.

In this study, we examined the link between parenting styles (specific ways in which parents interact with children in the home) and child behavioural problems as a potential mechanism underpinning the effect of parental SES on children's school achievement. Previous research showed that parents with a lower SES are more likely to engage in adverse parenting (Conger and Donnellan, 2007). We expect that parenting contributes to the intergenerational transmission of educational inequalities by influencing child developmental outcomes, such as social and emotional development, as indicated in levels of child behavioural problems. Another pathway underpinning the link between parental SES and children's school achievement is likely to be through child behavioural problems independent of parenting. Class differences in child behavioural problems are not only due to class-specific parenting practices, but they are also attributed to biological and epigenetic mechanisms. Thus, this study addresses the question whether and to what extent parenting styles and child behavioural problems separately and jointly mediate the association between parental SES and children's school grades.

To examine this question, we analysed data from the Families in Germany Study (FiD) on 816 children between the ages of 9 and 10 residing in 685 households that included the ratings of fathers and mothers on their parenting behaviour, on their children's behavioural problems and on their children's school grades for German and mathematics. We used the structural equation modelling (SEM) approach and the resampling method of bootstrapping with bias-corrected confidence intervals to answer our research questions. The remainder of the article is structured in five sections: theoretical considerations, including a review of both theoretical and empirical literatures, followed by our specific hypotheses; data and methods, which explains the data in detail; methodological approaches, and measures of the dependent, independent and control variables; results; and, finally, a discussion and the conclusion.

Theoretical background

Several theories and mechanisms have been proposed for the intergenerational transmission of SES. Much research in the past two decades has focused on the so-called secondary effect outlined by Boudon (1974), which refers to rational choice in educational decision making (Breen and Goldthorpe, 1997; Erikson and Jonsson, 1996). According to the models proposed by Breen and Goldthorpe, and Erikson and Jonsson, there are class-specific costs and benefits of higher education degrees, according to which students and parents from the upper classes anticipate greater benefits and lower costs with in relation to degrees than children from the lower classes. Various studies support these models (e.g. Becker and Hecken, 2009; Stocké, 2007; Tieben, 2009) by showing that children of middle-class origin achieve higher educational attainment than working-class children even when both groups demonstrate the same levels of school performance.

Class inequalities in education can also be attributed to the direct effects of parents' occupational and educational status on children's academic competencies (e.g. Feinstein, 2003; Kloosterman et al., 2009). These socioeconomic disparities in cognitive skills and academic performance are labelled 'primary effects' and can be defined as 'all those, whether of a genetic or socio-cultural kind, that are expressed via the association between children's class backgrounds and their actual levels of academic performance' (Jackson et al., 2007: 212).

The mechanisms underpinning the generation of primary effects relate to characteristics of individuals, families and societies. Erikson and Jonsson (1996) distinguish five reasons why the school performance of children from lower socioeconomic backgrounds is, on average, poorer than that of children from more advantaged backgrounds. First, class differences in ability may depend on genetic factors, and differences in intelligence are thought to account for educational inequality among children from different socioeconomic backgrounds. Second, class differences in school performance can be attributed to differences in family resources: parents with a higher SES have more economic, cultural and social resources with which to improve their children's academic performance. The third explanation focuses on schools as institutions that may perpetuate or exacerbate socioeconomic disparities in educational achievement. Because the norms and behaviours of the higher social strata dominate the education system, children of parents with a lower SES, who are unfamiliar with the cultural norms and values prevailing in school, are disadvantaged. Moreover, the unequal distribution of funding (and hence school facilities), teacher quality, curriculum differentiation practices within schools and concentration of disadvantaged children in the same school due to residential segregation may also contribute to class differences with regard to academic ability (Downey and Condron, 2016). However, a body of empirical evidence from research in the USA shows that schools compensate for rather than reproduce or exacerbate socioeconomic gaps in cognitive skills and achievement (Downey and Condron, 2016; Downey et al., 2004). The final two explanations suggested by Erikson and Jonsson (1996) refer to class differences in health and nutrition as well as class differences in sibling size.

Many arguments proposed by Erikson and Jonsson (1996), particularly those referring to class differences in economic, cultural and social resources, have also been proposed by the Family Investment Model (FIM). The FIM highlights child-rearing practices as a key driver of differences in child development due to SES. For instance, the ethnographic study, *Unequal Childhoods: Class, Race, and Family Life* by Lareau (2011: 47), shows that middle- and working-class families use different child-rearing approaches that differ in the organization of daily life, the use of language and social connections. Middle-class parents engage in 'concerted cultivation': they guide and help structure their children's cognitive and social development (beyond economic resource investment) through organized activities, by creating informal learning opportunities on a daily basis and by teaching them how to interact with and intervene in institutions. Middle-class parents use both reasoning and directives, and children are allowed to contest adult statements and negotiate with parents. These practices and values are more aligned with the broader societal values, thus contributing to the reproduction of social inequalities in educational attainment and life chances. Working-class parents are more involved in 'accomplishment of natural growth', whereby the parents are less involved, expect to be obeyed and provide less structure and management of after-school time. Similar findings have been reported by Kloosterman et al. (2010), who analysed panel data from four waves of the Dutch primary education cohort (1996/1997–2000/2001): parental reading socialization (reading examples and guidance) and parental school involvement both explained, in part, the strong association between parental education and academic performance. Furthermore, the gap in language skills between children with early reading socialization and those who lacked such experience widened over time.

Building upon the existing research, in this study we examined whether parenting styles and child behavioural problems mediate the effect of parental SES on children's school achievement. Whereas parents with a higher SES tend to use a parenting style that is based on extensive reasoning, parents with a lower SES tend to use an inconsistent parenting style that is characterized by being erratic in enforcing rules of conduct for the child and being volatile and harsh or permissive towards him/her (Areepattamannil, 2010; Conger et al., 2010). Adverse and inconsistent parenting, in turn, is associated with higher levels of child behavioural problems (Conger and Donnellan, 2007).

Child behavioural problems are generally subdivided into externalizing problems and internalizing problems,[1] and externalizing problems in particular have been shown to be strongly correlated with low academic achievement (Evensen et al., 2016; McLeod and Kaiser, 2004; Masten et al., 2005). Externalizing and internalizing problems have different trajectories over the life course (Fanti and Henrich,

2010). Aggressive behaviours are common in toddlers, but as children develop cognitive abilities and skills to regulate emotions, such behaviours diminish over the preschool and school-age period. However, a small proportion of children follow a persistent trajectory of externalizing problems during their life course. Longitudinal evidence shows that externalizing problems in childhood appeared to undermine later academic performance in adolescence, independent of IQ, parenting and SES. In contrast, internalizing symptoms demonstrated little influence on academic performance over time (Masten et al., 2005; Van der Ende et al., 2016). Internalizing problems are negatively associated with later externalizing behaviour as inhibition and anxiety might protect against delinquency, which in turn may protect children with internalizing behaviours from poor academic performance.

Among different parenting styles (emotional warmth, psychological and strict control, negative communication, or monitoring), inconsistent parenting is most strongly and most consistently correlated with child externalizing and internalizing problems (Dadds et al., 2003; Ellis and Nigg, 2009; Frick et al., 1999; Reichle and Franiek, 2009). Because inconsistent parenting is also associated with parental SES (Areepattamannil, 2010; Conger et al., 2010), we hypothesize that inconsistent parenting, in part, explains the association between parental SES and children's academic achievement through its association with child behavioural problems, particularly externalizing behaviour. It is also important to consider other parenting styles (strict control, psychological control and negative communication), as they may also have a negative impact on children's learning (e.g. motivation to learn, independence, perseverance, self-confidence) and may, additionally, explain, in part, the influence of parental SES on children's school grades.

Another pathway underpinning the link between parental SES and children's school achievement is likely to be through child behavioural problems independent of parenting. Parental SES has been shown to be strongly correlated with child behavioural problems (Bøe et al., 2012; Bradley and Corwyn, 2002; Lampert and Kurth, 2007; McLeod and Kaiser, 2004). These differences are not only due to class-specific parenting practices, but they are also attributed to biological and epigenetic mechanisms. During the intrauterine period, children of parents with a lower SES have greater exposure to stress (McEachan et al., 2016), poor nutrition (Freisling et al., 2006; Larrañaga et al., 2013), parental smoking and substance abuse (Cnattingius, 2004; Day et al., 1993; Hiscock et al., 2012), and environmental pollution and toxins (Evans and Kantrowitz, 2002). After birth they continue to be exposed to higher levels of stress (Mensah and Kiernan, 2010), and they are less likely to be breastfed (or breastfed for a shorter duration) and less likely to receive a high-quality diet (Kranz, 2006; North and Emmett, 2000; Scott and Binns, 1999) than children of parents with a higher SES. These biological and psychological circumstances in early life have been linked to increased risks for child and adolescent behavioural problems (Beydoun and Saftlas, 2008; Oddy et al., 2010; Robinson et al., 2010; Robinson et al., 2011).

This study aims to examine the interrelationships between parental SES, parenting styles, child behavioural problems and academic achievement, using data from the FiD and SEM. The FiD provides parent-reported school grades for German and mathematics for children between the ages of 9 and 10, as well as detailed information on parents' education, occupation, income, employment status, parenting styles and child behavioural problems as measured by the Strengths and Difficulties Questionnaire (SDQ). Figure 1 summarizes our hypotheses, with the numbers in the list below corresponding to pathways in Figure 1.

1. Child behavioural problems mediate the correlation between SES and school grades independent of inconsistent parenting (through pathways 3 and 6).
2. Inconsistent parenting mediates the correlation of parental SES with child behavioural problems (both internalizing and externalizing) (pathways 2 and 4).
3. The correlation between parental SES and child school grades is, in part, mediated by inconsistent parenting (pathways 2 and 5).
4. Inconsistent parenting and child behavioural problems jointly mediate the association between parental SES and children's school grades (pathways 2, 4 and 6).

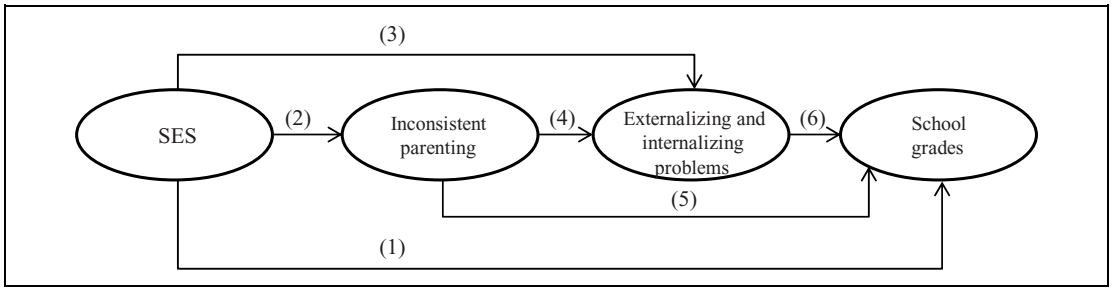

Figure 1. Stylized model.

5. Child behavioural problems mediate the effect of inconsistent parenting on school grades (pathways 4 and 6).
6. The above hypotheses apply to other parenting styles, including strict control, psychological control and negative communication.

Data and methods

The FiD (Schröder et al., 2013) is an extension of the German Socio-Economic Panel Study (Wagner et al., 2007), a household panel study that has run annually since 1984. The FiD includes families with more than two children, families in 'critical income brackets', single parents and children born between 2007 and 2010. The first three groups were sampled through a screening process that defined the eligibility of the households through a brief telephone interview before the main interview. The screening process took place between 2010 and 2011. The children born between 2007 and 2010 were randomly sampled from German registries. The FiD started in 2010 and collects information on parents, and children aged 0 to 10 annually. We used the data from the parent questionnaires for children aged between 9 and 10 and pooled all available waves (2010–2013). The questionnaire provides both parents' reports of their children's behavioural problems and school grades between the ages of 9 and 10. Our final effective sample included 816 children in 685 households.

A SEM was estimated to test our hypotheses. In the first step, the measurement part of the model was specified using simultaneous confirmatory factor analysis. Then, the structural part of the model was added and the full SEM was estimated. To test the robustness of the indirect effects, we used the resampling method of bootstrapping with bias-corrected confidence intervals (e.g. Hayes, 2013). Because 816 children lived in 685 households we used the robust maximum likelihood estimation to account for clustered standard errors at the household level. To adequately deal with missing values we employed the full information maximum likelihood (FIML) estimator. FIML has been shown to be one of the best methods of dealing with missing data even when the data deviate from missing at random (Arbuckle, 1996; Enders and Bandalos, 2001). The FiD data offer us the rare opportunity to analyse responses on key variables from both mothers and fathers. We used ratings of fathers and mothers on inconsistent parenting, on child behavioural problems and on their children's school grades for German and mathematics. We then combined these dual ratings into latent variables to increase the reliability of these constructs. Use of latent variables allows for a correction of measurement errors and, thus, reduces biased estimates (Bollen, 2009). To obtain standardized estimates for the latent variables, we needed to constrain the variance of each latent variable to be one (instead of one factor loading) in order to scale them. Because we had mothers' and fathers' reports on children's wellbeing, parenting and school grades, these latent variables consisted of two factor loadings. From a methodological point of view, more than two factor loadings are desirable, but because the SEM has enough degrees of freedom, the use of two factor loadings for each latent variable does not lead to identification problems.

Measures

Endogenous variables

In Germany, a 6-point grading scale is used to evaluate academic performance in children (1=very good; 2=good; 3=satisfactory; 4=sufficient; 5, 6=failure). For a more intuitive interpretation, the scale was reversed so that a higher number on the scale corresponded to a better school grade. By combining the reports of mothers and fathers into a latent variable we adjusted for measurement errors. However, it is important to keep in mind that there are potential measurement errors due to the fact that the school grades were not standardized across schools and that we could not take into account the clustering of children in schools and classes.

Mediators

Children's behavioural problems were measured with the SDQ that was developed by Goodman (1997). We were able to analyse the child SDQ scale based on fathers' and mothers' reports.[2] The SDQ covers four domains that include five items on a scale of 1 to 3, with 1 corresponding to 'Does not apply' and 3 to 'Fully applies'. The domain 'hyperactivity' includes items such as 'My child is restless, hyperactive, can't sit still long' or 'My child is constantly fidgeting'. Emotional symptoms involve items like 'My child is often unhappy, depressed or fearful' or 'My child has many fears, gets scared easily'. The scale for conduct problems includes, for instance, the items 'My child often loses his/her temper' and 'My child often fights with other children and bullies them'. The scale for peer problems includes items such as 'My child is rather solitary and prefers to play alone' or 'My child is picked on or bullied by other children'. These four domains of SDQ were aggregated into two subdomains of externalizing and internalizing problems, whereby a higher score corresponds to more behavioural problems. Externalizing problems include the scales for conduct problems and hyperactivity, whereas internalizing problems contain the emotional symptoms and peer problems scales (Achenbach et al., 2012; Goodman et al., 2010).

Based on SDQ cut-off points for the German population (for more information see Woerner et al., 2004), the SDQ scores can be grouped into three categories: 'Normal', 'Borderline', and 'Abnormal'. In the study sample (see Table 1), about 10% of the children show conduct problems and hyperactivity at the borderline/abnormal level, and about 12% show peer problems and emotional problems at the borderline/abnormal level. Hence, a considerable proportion of children show behavioural problems in the different SDQ dimensions. Children whose parents have not had tertiary education are more likely to show emotional problems (14%), peer problems (13%) and hyperactivity (13%) at the borderline/abnormal level than those whose parents have a university degree (12%, 8%, 5%, respectively). The same holds true for conduct problems (10% versus 7%).

The scale 'inconsistent parenting', is based on the expanded German version of the Alabama Parenting Questionnaire (Reichle and Franiek, 2005). Both mothers and fathers were asked to answer three items for inconsistent parenting on a scale from 1 to 5, with 1 corresponding to 'Never' and 5 corresponding to 'Frequently'. The three items include 'I reduce punishments or end them early', 'I threaten my child with a punishment but don't actually follow through' and 'I find it hard to set and keep consistent rules for my child'. Our main focus was on inconsistent parenting, given its strong and consistent association with child behavioural problems as shown in existing research.

Other parenting style scales (strict control, psychological control and negative communication) are also measured with three items on a Likert scale from 1 to 5. The negative communication scale is based on an instrument developed by Schwarz et al. (1997), and which includes the items 'I criticize my child', 'I yell at my child when he/she does something wrong' and 'I scold my child when I am angry at him/her'. The same is true for the scale for strict control, which includes the items 'I tend to be a strict parent', 'If my child does something against my will, I punish him/her' and 'I make it clear to my child that he/she is not to break my rules or question my decisions'. The scale for psychological

Table 1. Proportions of SDQ cut-off categories.

	Externalizing problems				Internalizing problems			
	Conduct problems		Hyperactivity		Emotional problems		Peer problems	
Ratings Mother								
Normal	732	90.48%	718	88.75%	695	85.80%	712	87.79%
Borderline	52	6.43%	39	4.82%	53	6.54%	49	6.04%
Abnormal	25	3.09%	52	6.43%	62	7.65%	50	6.17%
Total	809	100.00%	809	100.00%	810	100.00%	811	100.00%
Not academic household								
	Externalizing problems				Internalizing problems			
	Conduct problems		Hyperactivity		Emotional problems		Peer problems	
Ratings Mother								
Normal	507	89.42%	489	86.24%	484	85.21%	491	86.29%
Borderline	41	7.23%	36	6.35%	36	6.34%	35	6.15%
Abnormal	19	3.35%	42	7.41%	48	8.45%	43	7.56%
Total	567	100.00%	567	100.00%	568	100.00%	569	100.00%
Academic household								
	Externalizing problems				Internalizing problems			
	Conduct problems		Hyperactivity		Emotional problems		Peer problems	
Ratings Mother								
Normal	225	92.98%	229	94.63%	211	87.19%	221	91.32%
Borderline	11	4.55%	3	1.24%	17	7.02%	14	5.79%
Abnormal	6	2.48%	10	4.13%	14	5.79%	7	2.89%
Total	242	100.00%	242	100.00%	242	100.00%	242	100.00%

control is based on the Zurich Brief Questionnaire for the Assessment of Parental Behaviours by Reitzle et al. (2001) and includes the items 'I am disappointed and sad when my child misbehaves', 'I think my child is ungrateful when he/she does not obey me' and 'I don't talk to my child for a while when he/she does something'.

Exogenous variables

The main exogenous variable is parental SES, and it is commonly conceptualized as a combination of income, occupational status and education (e.g. Bradley and Corwyn, 2002). We constructed a latent variable for parental SES by combining the logarithm of monthly net household income, the highest level of the Standard International Occupational Prestige Scale (SIOPS) of the parents (Ganzeboom and Treiman, 1996) and the highest level of schooling (measured in years) of the parents. We controlled for child gender, the number of children in the household, use of after-school child care, mother's and father's age, their migration background and their working hours. Table 2 provides an overview of all variables analysed. In the left-hand column the mothers' ratings on child behaviour, child school grades and parenting style can be found; the fathers' ratings are shown in the right-hand column. Mothers' and

Table 2. Frequency distribution of all variables.

	Mother				*Father*			
Variables	Mean/%	SD	Range	*N*	Mean/%	SD	Range	*N*
School grades	Ø				Ø			
Mathematics	4.61	0.89	2–6*	761	4.64	0.87	2–6	685
German	4.60	0.83	2–6	759	4.60	0.83	2–6	684
Mediators	Ø				Ø			
Internalizing problems	3.17	2.84	0–15	810	3.14	2.74	0–14	749
Externalizing problems	4.23	3.16	0–18	807	4.64	3.05	0–19	749
Inconsistent parenting	2.58	0.73	1–5	809	2.63	0.72	1–4.67	750
Parental SES								
Schooling in years	13.26	2.87	7–18	815				
Treiman index (SIOPS)	41.54	13.74	13–78	761				
Net household income	8.03	0.43	6.74–9.9	816				
Sex=female (child)	50.86%	-	0–1	816				
Institutional childcare=yes	30.15%	-	0–1	816				
Covariates	Ø				Ø			
Working hours	13.35	14.53	0–65	806	40.38	15.71	0–78	763
Age	38.89	5.20	25–56	816	42.27	6.17	25–71	816
Migration background=yes	31.37%	-	0–1	816	27.08%	-	0–1	816
Sex=female (child)	50.86%	-	0–1	816				
Institutional childcare=yes	30.15%	-	0–1	816				
Number of children								
One child	2.70%	-	-	22				
Two children	27.08%	-	-	221				
More than two children	70.22%	-	-	573				

*1 and 2=not sufficient, 3=sufficient, 4=satisfactory, 5=good, 6=very good (reverse of the original scale).

fathers' reports of the child's externalizing problems show a zero-order (Spearman's) correlation of 0.65 and the same for internalizing problems show a zero-order correlation of 0.54.

With regard to the parenting styles, the zero-order correlation between the mothers' and fathers' scores for inconsistent parenting is 0.32. The zero-order correlations between SES indicators (education, income, occupational prestige) and child internalizing and externalizing problems are around -0.09 to -0.24. Information on whether or not the items used to measure the latent variables are adequate can be obtained from the measurement part of the model in Figure 1. The factor loadings are around 0.5, showing that they adequately represent the underlying latent construct.

Results

To avoid causal terminologies in describing the results based on the cross-sectional data, we used 'associations' or 'correlations' to describe the relationship between parenting and child behavioural problems, and that between child behaviour and school grades. Given that parental SES is established before children go to school and there is overwhelming evidence that parental SES influences children's educational attainment, we used the terms 'effect(s)' and 'influence' in describing the link between the two.

As expected, the SEM illustrated in Figure 2 shows that parental SES is significantly correlated with children's mathematics (b=.36, $p<0.001$) and German grades (b=.37, $p<0.001$), and that these correlations are the strongest in the whole path model. To explain these correlations, we now turn to three hypothesized pathways leading parental SES to children's school grades.

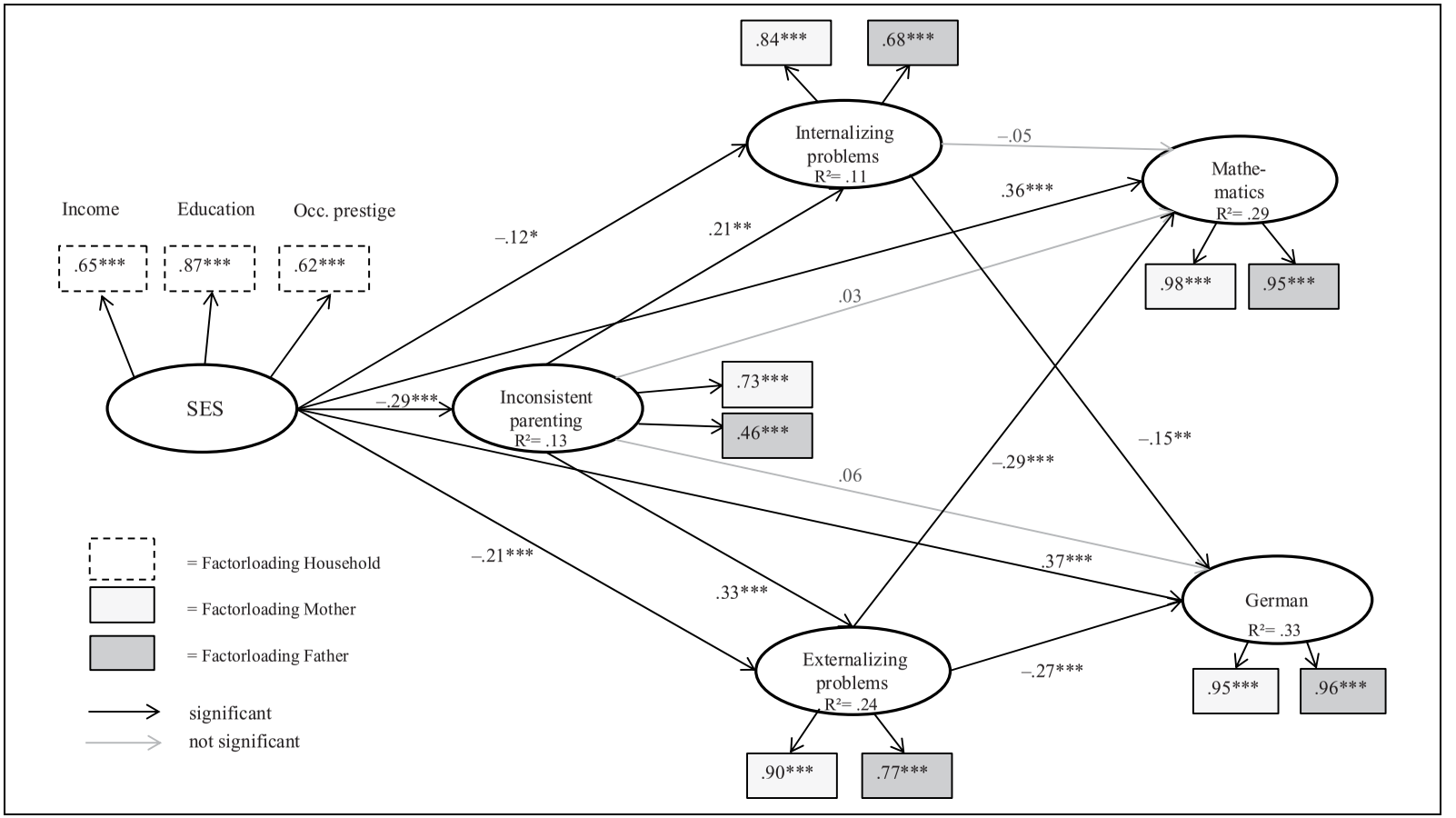

Figure 2. Structural equation model.
N=816. Controls: sex (child), age, migration background, working hours (mother and father), childcare, number of children in household. Standardized estimates. Model Fit: chi^2 450.287, df(145), RMSEA=0.051, CFI=0.937, TLI=0.909. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10.

Table 3. Decomposition of the effects of SES on strengths and difficulties and school grades.

	Strengths and difficulties		School grades	
	Externalizing problems	Internalizing problems	Mathematics	German
Direct effect	-0.21***	-0.12*	0.36***	0.37***
	(0.06)	(0.06)	(0.05)	(0.05)
Indirect effects				
Total indirect effect	-0.10**	-0.06*	0.09***	0.09***
	(0.03)	(0.02)	(0.02)	(0.03)
Specific indirect effects				
Via inconsistent parenting	-0.10**	-0.06*	-0.01	-0.02
	(0.03)	(0.02)	(0.00)	(0.02)
Via externalizing problems	-	-	0.06**	0.06**
	-	-	(0.02)	(0.02)
Via internalizing problems	-	-	0.01	0.02
	-	-	(0.00)	(0.01)
Via inconsistent parenting and externalizing problems	-	-	0.03**	0.03*
	-	-	(0.01)	(0.01)
Via inconsistent parenting and internalizing problems	-	-	0.00	0.01^{+}
	-	-	(0.00)	(0.01)
Total effect	-0.30***	-0.18**	0.45***	0.46***
	(0.05)	(0.05)	(0.04)	(0.04)

Note. Standardized estimates. Results correspond to the model presented in Figure 2. Standard errors in parentheses. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10. The appropriateness of the significance of the indirect effects was tested using bootstrapping with bias-corrected confidence intervals (2000 requested samples). Results were robust.

With respect to the first hypothesis, 'child behavioural problems mediate the correlation between SES and school grades', Figure 2 demonstrates that parental SES is significantly associated with both internalizing (b=-0.12, p<0.05) and externalizing (b=-0.21, p<0.001) problems: children of parents with a high SES had lower levels of behavioural problems. Further, child externalizing problems were strongly correlated with lower school grades for both German (b=-0.27, p<0.001) and mathematics (b=-0.29, p<0.001), but internalizing problems were only correlated with German grades and not with mathematics grades. The results from formal tests for externalizing and internalizing problems as mediators are shown in Table 3. Externalizing problems significantly mediated the effect of SES on school grades (b=0.06, p<0.01, for both mathematics and German), whereas internalizing problems did not. The bottom row in Table 3 shows the total effect of SES on German grades (b=0.46, p<0.001) and mathematics (b=0.45, p<0.001). The indirect effects on school grades via externalizing problems explained about one seventh of the total SES effect: b=0.06/b=0.45 for mathematics, b=0.06/b=0.46 for German.

With regard to the second hypothesis, 'inconsistent parenting mediates the correlation between parental SES and child behavioural problems', Figure 2 clearly shows that parental SES is somewhat strongly correlated with inconsistent parenting (b=-0.29, p<0.001) and moderately associated with externalizing and internalizing problems (b=-0.21, p<0.001 and b=-0.12, p<0.05, respectively). Furthermore, inconsistent parenting is associated with child behavioural problems, the association being stronger for externalizing problems than for internalizing problems. Table 3 shows that inconsistent parenting mediates the effect of SES on externalizing and internalizing problems to a considerable degree (b=-0.10, p<0.01 and b=-0.06, p<0.05, respectively): about one-third of the total SES effect on externalizing problems (b=-0.10/b=-0.30) and internalizing problems (b=-0.06/b=-0.18) was

Table 4. Decomposition of the effects of inconsistent parenting on school grades.

	School grades	
	Mathematics	German
Direct effect of inconsistent parenting	0.03	0.06
	(0.06)	(0.06)
Indirect effects		
Total indirect effect	-0.11***	-0.12***
	(0.03)	(0.03)
Specific indirect effects		
Via externalizing problems	-0.10***	-0.09**
	(0.03)	(0.03)
Via internalizing problems	-0.01	-0.03*
	(0.01)	(0.02)
Total effect of inconsistent parenting	-0.08	-0.06
	(0.06)	(0.05)

Note. Standardized estimates. Standard errors in parentheses. Results belong to the model presented in Figure 2. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10.

attributed to inconsistent parenting (see bottom row in Table 3). We did not find evidence for our third hypothesis, 'the correlation between parental SES and child school grades is, in part, mediated by inconsistent parenting'. Neither the indirect effect of SES on mathematics via inconsistent parenting (b=-0.01) nor the same on German grades (b=-0.02) was significant and the effect sizes were very small (see Table 3).

The results in Table 3 support the fourth hypothesis, 'the correlation between SES and school grades is jointly mediated via inconsistent parenting and child behavioural problems'. The indirect effects of SES via inconsistent parenting and externalizing problems on mathematics (b=0.03, p<0.01) and German (b=0.03, p<0.05) were significant. Hence, even if inconsistent parenting alone does not significantly explain the correlation between SES and school grades (Hypothesis 2), it does play a role as a mediator jointly with externalizing problems (Hypothesis 4). The indirect effect of SES via inconsistent parenting and internalizing problems on mathematics (b=0.00) was not significant, and this effect was only marginally significant for German (b=0.01, p<0.10). This is consistent with previous studies that have also shown that internalizing behaviours are not strongly associated with school performance.

We hypothesize that inconsistent parenting has an indirect effect on school grades via child behavioural problems (Hypothesis 5). Our results show that inconsistent parenting has an indirect effect on both German (b=-0.09, p<0.01) and mathematics grades (b=-0.10, p<0.001) via externalizing problems, and a smaller effect via internalizing problems on German (b=-0.03, p<0.05 (see Table 4).

Other parenting styles

Further analysis (see Table 5) showed that strict control, emotional warmth and negative communication did not play a role in mediating the effects of SES on behavioural problems and school grades. In contrast, psychological control had similar mediating effects to those of inconsistent parenting: It mediated the effect of SES on child behavioural problems (indirect effects: internalizing problems b=-0.13, p<0.01; externalizing problems: b=-0.16, p<0.01). It also mediated the effect of SES on school grades via its influence on externalizing behaviour (German: b=0.05, p<0.05; mathematics: b=0.05, p<0.05) and, to a lesser extent, via internalizing problems (German: b=0.02, p<0.05). In

Table 5. Indirect effects of further parenting styles relating to SES on behavioural problems and school grades.

	Strengths and difficulties		School grades	
	Externalizing problems	Internalizing problems	Mathematics	German
Specific indirect effects				
Psychological control				
Via psychological control	-0.16**	-0.13**	-0.01	-0.04
	(0.06)	(0.05)	(0.02)	(0.03)
Via psychological control and externalizing problems	-	-	0.05*	0.05*
	-	-	(0.02)	(0.02)
Via psychological control and internalizing problems	-	-	0.01	0.02*
	-	-	(0.01)	(0.01)
Emotional warmth				
Via emotional warmth	-0.05	-0.05	-0.01	0.02
	(0.03)	(0.03)	(0.01)	(0.01)
Via emotional warmth and externalizing problems	-	-	0.01	0.01
	-	-	(0.01)	(0.01)
Via emotional warmth and internalizing problems	-	-	0.00	0.01
	-	-	(0.00)	(0.01)
Strict control				
Via strict control	0.01	0.00	0.00	0.00
	(0.03)	(0.03)	(0.00)	(0.00)
Via strict control and externalizing problems	-	-	-0.00	-0.00
	-	-	(0.01)	(0.01)
Via strict control and internalizing problems	-	-	0.00	-0.00
	-	-	(0.00)	(0.00)
Negative communication				
Via negative communication	-0.01	-0.01	-0.00	-0.00
	(0.04)	(0.03)	(0.01)	(0.01)
Via negative communication and externalizing problems	-	-	0.00	0.00
	-	-	(0.01)	(0.01)
Via negative communication and internalizing problems	-	-	0.00	0.00
	-	-	(0.00)	(0.00)
Monitoring				
Via monitoring	-0.04	-0.04	0.02	0.04^{+}
	(0.02)	(0.03)	(0.02)	(0.02)
Via monitoring and externalizing problems	-	-	0.01	0.01
	-	-	(0.01)	(0.01)
Via monitoring and internalizing problems	-	-	0.00	0.01
	-	-	(0.00)	(0.00)

Note. Standardized estimates. Standard errors in parentheses. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10.

addition, the parenting style 'monitoring' mediated the effect of SES on German via internalizing problems, but with only marginal significance ($b=0.04$, $p<0.10$).

Robustness of the results

To check the robustness of the results we conducted several analyses. First, we estimated the SEM using sampling weights and auxiliary variables (see Appendix, Table A.1). We used mothers' and fathers'

general life satisfaction, satisfaction with family life and satisfaction with health as auxiliary variables. The effect sizes of the model are very similar to the ones of the unweighted model (see Table 3), but some indirect effects were no longer significant and some decreased to the 10% level (see Appendix, Table A.1). A major limitation of the model with auxiliary variables and sampling weights is that it does not allow for bootstrapping and it uses the Sobel Test, which is conservative and has little power (MacKinnon et al., 1995). To overcome these limitations, we estimated an alternative model using sampling weights and bootstrapping but not auxiliary variables (see Appendix, Table A.2). As with the results from the unweighted model (see Table 3), the indirect effects from the second weighted model remain significant. Therefore, we conclude that our results are robust when using both bootstrapping and sample weights.

Due to the fact that our analysis was cross-sectional, we could not rule out possible reverse causality. For example, it is plausible that poor school performance makes children unhappy and leads to loss of self-confidence, which in turn causes child behavioural problems. Similarly, child behavioural problems may make it difficult for parents to be consistent in disciplining children. To partially address this problem, we made use of additional data on SDQ and parenting styles, collected when the children were between the ages of 7 and 8, two years prior to the time point when information on school grades was collected between the ages of 9 and 10. We used OLS regression models and restricted the analysis to mothers' ratings only to reduce the number of missing values. We regressed externalizing problems (N=1081) between the ages of 9 and 10 on inconsistent parenting (b=0.20, $p<0.001$) and psychological control (b=0.24, $p<0.001$) measured between ages 7 and 8. Internalizing problems (N=1081) were regressed on inconsistent parenting (b=0.10, $p<0.01$) and psychological control (b=0.15, $p<0.001$) in the same way. Additionally we regressed the mathematics grades (N=978) reported between the ages of 9 and 10 on externalizing problems (b=-0.33, $p<0.001$) and internalizing problems (b=-0.05) measured two years earlier between ages 7 and 8. Likewise, German grades (N=975) were regressed on externalizing problems (b=-0.36, $p<0.001$) and internalizing problems (b=-0.03) two years earlier. These results were consistent with the findings generated from the SEM (see Figure 2).

Discussion

We have demonstrated that it is important to consider the psychological constructs of child behavioural problems as well as parenting styles as potential intergenerational transmission mechanisms underpinning the persistent, strong influence of parents' SES on their children's school achievement. Consistent with our hypotheses, certain parenting styles and child externalizing problems play a role in this transmission process, but the question as to whether or not they are the main mechanisms can only be answered by more vigorous future research. Children of parents with a higher SES are less likely to develop behavioural problems, and this, in turn, is associated with better school grades. Inconsistent parenting and psychological control explain, in part, the correlation between SES and child behavioural problems and they also, in part, mediate the effect of parental SES on school grades via its association with child externalizing problems. Our findings show that internalizing problems play a less significant role in the transmission process. Previous research has also shown that internalizing problems in childhood or adolescence generally does not predict later educational outcomes, but externalizing problems are consistently associated with poor educational outcomes later in life (Evensen et al., 2016; Masten et al., 2005; Van der Ende et al., 2016). Children with internalizing problems may be better able to regulate their attention so that they can concentrate on learning.

To the best of our knowledge, no previous research has examined parenting and child behavioural problems and their interrelationship as possible mechanisms that explain the association between parental SES and child school grades. In a recent study, Kaiser and Diewald (2014) found that the strong link between parental education and school grades in German primary school children was partially explained via 'Focus' (a specific facet of the personality trait, 'Conscientiousness'). They further showed that the correlation between parental education and children's Focus was partially mediated via an

authoritative parenting style. However, the authors did not examine child behavioural problems or the interplay between parenting and child behavioural problems as mediating factors. Our study has demonstrated that child behavioural problems, in part, explain the influence of parental SES on children's academic achievement. It has also shown that parenting styles, such as inconsistent parenting and psychological control, play an important role in translating parental SES into better school grades for mathematics and German through their linkage with externalizing child behavioural problems. This finding suggests that it is important to examine multiple pathways involving the relationship between parenting styles and child behavioural problems in order to unravel the complex process of intergenerational transmission of SES.

Our study has several methodological strengths that contribute to the robustness of the results. First, we used different sources of observer ratings of child behaviour and parenting styles to minimize reporting bias. We used ratings of mothers and fathers for the endogenous variables and built them into latent variables, which is a rare practice in current research due to lack of data. Second, we formally tested for the hypothesized mediators by using bootstrapping with bias-corrected confidence intervals, thereby minimizing the downward bias. Third, estimating a SEM allowed us to elucidate complex pathways leading from parental SES to children's school achievement via parenting, child behavioural problems and their interrelationships. We adequately handled missing data by using FIML. A major limitation of this study is that we could only analyse cross-sectional data. To address the potential problems of reverse causality, we ran robustness checks by using the measures of child behaviour and parenting collected at earlier time points. Results from this further analysis confirmed the findings of the SEM presented, although the results of the OLS regression models ought to be interpreted with caution due to a relatively large amount of unexplained variance in the models. Additionally, our analysis was informed by a body of strong empirical evidence for the influence of parenting style on child behavioural problems and how they are related to parental SES (Bayer et al., 2008; Bøe et al., 2014). Because of the cross-sectional nature of the data, we cannot rule out self-selection bias. However, we have controlled for a range of sociodemographic characteristics (e.g. parents' migration background, their work hours, use of child care and the number of children in the household) by which parents and children may select into inconsistent parenting. Nevertheless, longitudinal data are required to address potential selection effects due to unobserved individual and household characteristics. Our results suggest a plausible causal pathway from parental SES to children's academic achievement involving parenting and child behavioural problems as mechanisms, but these findings need to be replicated with longitudinal data. Furthermore, they need to be replicated using more comprehensive data with a greater number of study participants to determine to what extent the findings can be generalized to the wider population.

It is also important for future research to examine whether or not and how the effect of family SES on academic achievement via behavioural problems may depend on a country's healthcare system (Zwaanswijk et al., 2003). Research in the USA and Australia has shown that families with a higher SES are more likely to seek treatment for child mental health problems than families with a lower one (Cohen and Hesselbart, 1993; Cunningham and Freiman, 1996), whereas in France, Finland and the Netherlands, where healthcare is more accessible and affordable for all socioeconomic strata, there is no association between SES and seeking help (Verhulst and Van Der Ende, 1997; Zwaanswijk et al., 2003). Similarly, findings for Germany show that parental SES is not associated with mental health care issues among children and adolescents (Hintzpeter et al., 2015). Thus, the effects of family SES on academic achievement via behavioural problems and jointly with parenting style found in the current study might be smaller than those in countries with greater SES disparities in access to and use of healthcare.

Conclusion

Since the pioneer sociologists launched their empirical inquiry about status attainment in the 1960s and 1970s (Blau and Duncan, 1967; Featherman and Hauser, 1978) and revealed a strong influence of

parental SES on children's educational attainment, occupation status and earnings, mechanisms that explain the persistent influence of parental SES on children's educational achievement remain an important topic in current research on social inequality and social stratification. We contribute to this research by providing new insights into the complex process of intergenerational transmission of social inequality. We have incorporated psychological and child developmental concepts into this enduring sociological inquiry and have shown that parenting style and child behavioural problems play a role in translating parents' social and economic advantage into better school outcomes for their children. Our study demonstrates the benefits of bringing other disciplinary perspectives into sociological inquiries, and it calls for wider cross-disciplinary research on intergenerational transmission of status attainment.

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Notes

1. Children with externalizing problems can be described by way of conduct problems and hyperactivity. Children with internalizing problems show anxious, withdrawn, inhibited and depressed behaviours. Internalizing problems affect the child's internal psychological environment more than the external world (Goodman, 1997; Liu, 2004).
2. In the survey years 2010 and 2011 the FiD used a shortened instrument of the SDQ (18 items) for the children between the ages of 9 and 10. Compared with the full SDQ questionnaire (25 items) the reliability of the scales of the shortened version was in a very similar range. Therefore, we used the scores of the years 2010–2011 and 2012–2013 together in the analysis. Further information can be requested from the authors.

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Author biographies

Till Kaiser obtained a PhD in Sociology from the University of Bielefeld in Germany. He is a research fellow in the Department of Psychology at the Ruhr-University Bochum and a visiting researcher at the WZB Social Science Centre in Berlin. His research interests include social inequality and work–family research.

Jianghong Li completed her PhD degree at Louisiana State University in the USA in 1992 and she was awarded the Melon Postdoctoral Fellowship at the University of Washington 1992–1993. She is a senior researcher at the WZB Social Science Centre in Berlin. Her current research focuses on the impact of parental employment status, work hours, work schedules and job characteristics on children's health and development. She has published widely in leading international peer-reviewed journals on child health and development.

Matthias Pollmann-Schult is Professor of Social Research Methods at the University of Magdeburg in Germany. His research interests include the impact of parenthood on fathers' employment, the association between parenthood and life satisfaction, and the effect of non-standard work on family wellbeing. His research has been published in the *European Sociological Review*, the *Journal of Marriage and Family* and the *Journal of Family Issues*, among other journals.

Appendix

Table A.1. Decomposition of the effects of SES on strengths and difficulties and school grades (model with sampling weights and auxiliary variables).

	Strengths and difficulties		School grades	
	Externalizing problems	Internalizing problems	Mathe-matics	German
Direct effect	-0.16^{+}	-0.11	0.42***	0.45***
	(0.08)	(0.07)	(0.07)	(0.06)
Indirect effects				
Total indirect effect	-0.03^{+}	-0.03*	0.07*	0.06^{+}
	(0.02)	(0.02)	(0.03)	(0.03)

(continued)

Table A.1. (continued)

	Strengths and difficulties		School grades	
	Externalizing problems	Internalizing problems	Mathe-matics	German
Specific indirect effects				
Via inconsistent parenting	-0.03^{+}	-0.03*	0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Via externalizing problems	-	-	0.03	0.04^{+}
	-	-	(0.03)	(0.03)
Via internalizing problems	-	-	0.01	0.02
	-	-	(0.01)	(0.02)
Via inconsistent parenting and externalizing problems	-	-	0.01	0.01^{+}
	-	-	(0.01)	(0.01)
Via inconsistent parenting and internalizing problems	-	-	0.00	0.00
	-	-	(0.00)	(0.00)
Total effect	-0.19*	-0.14^{+}	0.48***	0.50***
	(0.08)	(0.08)	(0.06)	(0.06)

Note. Standardized estimates. Standard errors in parentheses. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10.

Table A.2. Decomposition of the effects of SES on strengths and difficulties and school grades (model with sampling weights and bootstrapped confidence intervals (2000 requested samples)).

	Strengths and difficulties		School grades	
	Externalizing problems	Internalizing problems	Mathematics	German
Direct effect	-0.15^{+}	-0.12	0.40**	0.43**
	[-0.31, 0.00]	[-0.28, 0.02]	[0.26, 0.55]	[0.32, 0.54]
Indirect effects				
Total indirect effect	-0.03*	-0.03*	0.06*	0.06^{+}
	[-0.07, -0.00]	[-0.06, -0.01]	[0.01, 0.14]	[-0.00, 0.13]
Specific indirect effects				
Via inconsistent parenting	-0.03*	-0.03*	0.01	-0.01
	[-0.06, -0.00]	[-0.06, -0.01]	[-0.01, 0.05]	[-0.05, 0.01]
Via externalizing problems	-	-	0.03*	0.04*
	-	-	[0.00, 0,10]	[0.00, 0.11]
Via internalizing problems	-	-	0.01	0.02
	-	-	[-0.01, 0.06]	[-0.01, 0.07]
Via inconsistent parenting and externalizing problems	-	-	0.01**	0.01**
	-	-	[0.00, 0.02]	[0.00, 0.02]
Via inconsistent parenting and internalizing problems	-	-	0.00	0.00^{+}
		-	[-0.00, 0.01]	[-0.00, 0.02]
Total effect	-0.18*	-0.14*	0.47**	0.49**
	[-0.34, -0.03]	[-0.31, -0.00]	[0.35, 0.61]	[0.38, 0.60]

Note. Standardized estimates. 95% confidence intervals in parentheses. Levels of significance: ***p<0.001, **p<0.01, *p<0.05, $^{+}$p<0.10.